PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

Application No.	:	10/591,297
Confirmation No.	:	9108
Applicant	:	Sergej Lopatin et al.
Filed	:	Aug. 31, 2006
Title	:	Apparatus for Determining and/or Monitoring a Process Variable
TC/A.U.	:	2856
Examiner	:	J. M. Saint Surin
Docket No.	:	LOPA3011/FJD
Customer No.	:	23364

BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22202-3514

Sir:

INTRODUCTORY COMMENTS

Pursuant to the provisions of 37 CFR 41.37, submitted herewith is Applicant/Appellant's Brief on Appeal along with the required fee.

Any additional fees necessary for this appeal may be charged to the undersigned's Deposit Account No. 02-0200.

REAL PARTY IN INTEREST

(37 CFR 41.37(c)(1)(i)

The real party in interest is Applicant/Appellant's assignee Endress + Hauser GmbH + Co. KG. The assignment was recorded on June 22, 2007 at Reel 019527 and Frame 0810.

RELATED APPEALS AND INTERFERENCES

(37 CFR 41.37(c)(1)(ii)

There are no related appeals or interferences with respect to the invention defined in this application.

STATUS OF CLAIMS

(37 CFR 41.37(c)(1)(iii))

Claims 1 - 13 have been cancelled.

Claims 14-26 are pending in this application.

Claims 14-26 have been finally rejected, and are therefore the subject of this appeal.

STATUS OF AMENDMENTS

(37 CFR 41.37(c)(1)(iv))

No amendment was filed after issuance of the Office Action of November 24, 2009.

A Notice of Appeal was filed with a two month extension of time on Apirl 26, 2010.

SUMMARY OF CLAIMED SUBJECT MATTER

(37 CFR 41.37 (c)(1)(v))

(References are to page and line of the specification)

The invention defined by the claims in this appeal relates in one aspect to an apparatus for determining and/or monitoring at least one physical or chemical, process variable of a medium (pg 1, lines 4 and 5), and in another aspect relates to a method for changing the resonance frequency of an apparatus for determining and/or monitoring at least one physical or chemical, process variable of a medium with at least one oscillatable unit, which produces and/or receives mechanical oscillations (pg. 8, line 30 to pg. 9, line 2)

For mapping purposes, the independent claims are claims 14 and 26.

Claim 14 defines an apparatus having:

at least one oscillatable unit (pg 2, line 14) which produces, and/or receives, mechanical oscillations (pg. 9, lines 1 and 2);

at least one tuning unit (pg 2, line 12) whose stiffness is variable and which is embodied in such a manner and connected in such a manner with said oscillatable unit, or is a component of said oscillatable unit in such a manner, that at least the resonant frequency of said oscillatable unit is changeable via said at least one tuning unit (pg 2, lines 12 - 21,

Claim 26 defines a method comprising the steps of:

providing at least one oscillatable unit (pg. 2, line 14), which produces and/or receives mechanical oscillations; (pg 9, lines 1 and 2);

connecting a tuning unit, with the oscillatable unit or is a part of the oscillatable unit (pg 9, lines 8 - 10); and

changing the stiffness of the at least one tuning unit (pg 9, lines 9 - 14)

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

(37 CFR 41.37(c)(1)(vi))

The Office Action of November 24, 2009 presents three (3) final rejections which include the two independent claims resulting in three (3) issues to be decided on this appeal; and one further final rejection of one of the dependent claims, resulting in four (4) issues. These issues can be framed as follows:

(1) Are claims 14 - 24 and 26, which have been finally rejected, anticipated by Pfandler under 35 USC 102(b)?;

(2) Are claims 14, 15, 17 - 20, 22, 24 and 26, which have been finally rejected, anticipated by D'Angelico under 35 USC 102(e)?;

(3) Are claims 14, 15, 17, 18 and 26, which have been finally rejected, anticipated by Getman et al under 35 USC 102(e)?; and

(4) Is claim 25, which has been finally rejected, rendered obvious by Pfandler in view of Drahm under 35 USC 103(a)?

ARGUMENTS

(37 CFR 41.37(c)(1)(vii))

(1)

It is well settled law that anticipation lies only when a single reference discloses each and every positively recited limitation in a claim, ***In re Bond***, 15 USPQ2d 1566 (Fed. Cir. 19909), and this does not mean that any limitation, whether structure or a method step, can be fabricated to produce identity, that is if, for example, a rod is claimed, it is not permissible to suggest that a plate amounts to a rod.

In claim 14, the defined apparatus includes a tuning unit. The examiner states that element 31 of Pfandler is a tuning unit. It is not. Pfandler discloses a device for determining a predetermined fill level in a container with an oscillatory unit that comprises two rods that are attached at a distance from each other on a membrane, wherein the oscillatory unit is driven by a stack of piezoelectric elements, not a tuning unit. Pfandler lacks the teaching of a tuning unit, and without this teaching Pfandler cannot anticipate claim 14. Also, how can the teaching of two spaced apart rods (Pfandler) anticipate an apparatus with a single rod or concentric rods. That amounts to stretching the teaching of a reference to an impermissible degree.

According to claim 14, the tuning unit possesses a variable stiffness and at least the resonant frequency of the oscillatable unit is changeable via the at least one tuning unit. There is no such teaching in Pfandler. Once again, therefore, anticipation by Pfandler cannot lie.

Devices for measuring the fill level of a medium with an oscillatory unit often use a change in the resonance frequency as a measure for the fill level. Pfandler discloses a mechanical oscillation system that consists of a membrane and to rods that are attached to the membrane at a distance from each other. The membrane forms the return spring for this oscillation system. The natural resonance frequency of the mechanical oscillation system depends on two parameters: the spring constant of the spring and the total mass that can be altered in dependence on the mass of the surrounding medium carried by the oscillation rods. A change in the carried mass is hence connected with a change in resonance frequency and indicates a change of the fill level. As stated in col. 6, lines 51 - 54 of Pfandler, the spring constant can be considered to be constant. This only holds if the stiffness is constant, or in other words, not variable, which is contrary to the intent of the present invention. Accordingly, the membrane is not a tuning unit

(2)

Here too, the teaching of ***In re Bond*** applies; and again the examiner confuses the tuning unit with a membrane. The membrane and the rods attached thereto oscillate at a predetermined frequency, driven by a driver/receiver unit. The oscillation circuit formed of the oscillatable unit with the driver/receiver unit and feedback electronics is provided with a microprocessor that corrects the phase of th feedback electronics. Those skilled in the art know that by adjusting the phase between the sending signal and the receiving signal of the driver/receiver unit in the oscillation circuit, the frequency with which the

oscillatable unit oscillates is adjusted. In other words, the membrane oscillates at an excitation frequency determined by the oscillation circuit. Whether this is the resonance frequency or not is not disclosed. In fact, the resonance frequency is not even mentioned in D'Angelico. It follows, therefore, that no tuning unit is disclosed or intended in the teaching of D'Angelico for changing resonsce frequency.

Like Pfandler, D'Angelico does not disclose a rod coaxially surrounding another rod.

(3)

Here too, the teaching of ***In re Bond*** applies. Getman does not disclose a tuning unit, and unlike Pfandler and D'Angelico, the examiner does not mention what the tuning unit might be. Getman discloses a special embodiment of a vibration detector, especially a tuning fork, with a tubular housing to which the membrane and the oscillatory rods are secured. A tubular inner part, that serves as a shielding for the drive/receiving unit and is positioned between the drive/receiving unit and the wall of the housing. The passage of Getman cited by the examiner describes an advantageous mechanical embodiment of the detector, in which the membrane, the housing and the tubular inner part are welded to one another in a region with an annular bed. The invention of Getman relates to the tubular inner part that makes the detector function reliably in applications with high temperature changes, it does not relate or teach the invention of the claims on appeal.

(4)

Obviousness based upon a combination of references requires a suggestion in at least one of the references being combined, ***In re Gordon***, 221

USPQ1125 (Fed. Cir. 1984). The examiner states that with respect to claim 25, which depends from claim 14, "Pfandler discloses the claimed inventionexc3ept for the limitations of a Coriolis mass flow ....." Applicant/Appellant cannot agree. As noted above in (1), Pfandler lacks the tuning unit, and Drahm does not provide the suggestion to modify Pfandler for the purpose of including a tuning unit as claimed in claim 14. Therefore, the combination must fail and obviousness cannot lie.

CONCLUSION

In view of the above, it is clear that the references do not disclose teach or suggest a tuning unit as claimed. It is respectfully submitted, therefore, that claims 14 - 26 should be allowed, and the noted rejections reversed.

Respectfully submitted

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APPENDIX OF CLAIMS
(37 CFR 41.37 (c)(1)(viii)

Claims 1 - 13 (Cancelled).

14. An apparatus for determining and/or monitoring the fill level, density and/or viscosity of a medium in a container or the volume and/or mass flow of a fluid in a pipe, having:

at least one oscillatable unit which produces, and/or receives, mechanical oscillations;

at least one tuning unit whose stiffness is variable and which is embodied in such a manner and connected in such a manner with said oscillatable unit, or is a component of said oscillatable unit in such a manner, that at least the resonance frequency of said oscillatable unit is changeable via said at least one tuning unit.

15. The apparatus as claimed in claim 14, wherein:

said tuning unit comprises a piezoelectric material, which is connected with electrodes and whose stiffness is changeable at least by an electric current between the electrodes.

16. The apparatus as claimed in claim 14, wherein:

said tuning unit comprises a magnetostrictive material whose stiffness is changeable at least by an applied magnetic field.

17. The apparatus as claimed in claim 14, further having:

a control unit which controls said tuning unit electrically.

18. The apparatus as claimed in claim 17, wherein:

said control unit is embodied in such a manner that it tunes the resonance frequency of said oscillatable unit as a function of the oscillation amplitude and/or oscillation frequency of the mechanical oscillations produced and/or received by said oscillatable unit.

19. The apparatus as claimed in claims 14, wherein:

at least one inner oscillatory rod and an outer oscillatory rod are provided in said oscillatable unit;

said outer oscillatory rod surrounds said inner oscillatory rod coaxially;

said outer oscillatory rod and said inner oscillatory rod are coupled together; and

at least one tuning unit is coupled at least with one of said oscillatory rods.

20. The apparatus as claimed in claim 19, wherein:

said tuning unit is connected at least with said inner oscillatory rod.

21. The apparatus as claimed in claim 14, wherein:

at least one sending/receiving piezo is provided in said oscillatable unit;

said tuning unit is a part of said oscillatable unit; and

the resonance frequency of said oscillatable unit lies in the ultrasonic range.

22. The apparatus as claimed in claim 14, wherein:

at least one front-side mass and one rear-side mass are provided in said oscillatable unit;

at least one sending/receiving piezo is provided between the two masses;

at least one tuning unit is part of one of the two masses; and

the resonance frequency of said oscillatable unit lies in the ultrasonic range.

23. The apparatus as claimed in claim 21, wherein:

at least one matching layer is provided in said oscillatable unit for coupling to the medium.

24. The apparatus as claimed in claim 22, wherein:

at least one bolt is provided in said oscillatable unit for producing a prestress.

25. The apparatus as claimed in claim 14, wherein:

said oscillatable unit includes at least one measuring tube of a measurement pickup of vibration-type inserted into the course of a pipeline, especially a Coriolis mass flow or a Coriolis mass flow/density meter.

26. A method for changing the resonance frequency of an apparatus for determining and/or monitoring the fill level, density and/or viscosity of a medium in a container or the volume and/or mass flow of a fluid in a pipe, comprising the steps of:

providing at least one oscillatable unit, which produces and/or receives mechanical oscillations;

connecting a tuning unit, with the oscillatable unit or is a part of the oscillatable unit; and

changing the stiffness of the at least one tuning unit.

EVIDENCE APPENDIX

There is no evidence being relied upon which was submitted pursuant to 37 CFR 1.130, 1.131 or 1.132.

RELATED PROCEEDINGS APPENDIX

There is no related proceeding being relied upon.

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